



**2002**

***8.1L LPG MEDIUM DUTY  
OWNER'S MANUAL  
SUPPLEMENT***



# QUANTUM 2002 8.1L LPG Medium Duty Owner's Manual Supplement

## Section 1

### **Features and Controls**

This section explains how to start and operate your vehicle.

## Section 2

### **Problems on the Road**

This section tells you what to do if you have a problem on the road.

## Section 3

### **Service Care**

Here the manual tells you how to keep your vehicle running properly.

## Section 4

### **Maintenance Schedule**

This section tells you when to perform vehicle maintenance.

## Section 5

### **Customer Assistance Information**

This section tells you how to contact QUANTUM for technical assistance.

## Section 6

### **Index**

Here's an alphabetical listing of every subject in this manual.

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This manual includes the latest information at the time it was printed. We reserve the right to make changes in the product after that time without further notice

Please keep this manual in your vehicle, so it will be there if you ever need it when you're on the road. If you sell the vehicle, please leave this manual in it so the new owner can use it.

## Introduction

Your vehicle is designed to operate on Liquefied Petroleum Gas (LPG), also known as propane. There are abundant reserves of propane in the United States and Canada. When propane is burned in your engine, it produces low emissions. This means less smog, less air pollution and cleaner air. This makes propane a promising motor fuel for the future.

## How to Use this Supplement

This supplement contains information specific to the LPG fuel system on your vehicle. It doesn't explain everything you need to know about your vehicle. **You must use this supplement along with your GM owner's manual.** Only then will you be able to properly operate and maintain your vehicle.

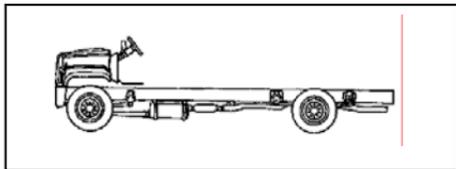
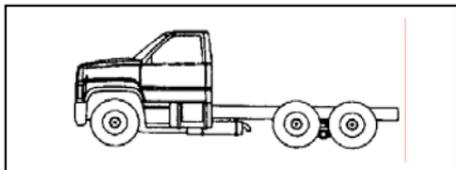
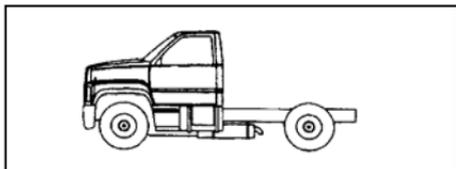
Please read this supplement from beginning to end when you first receive your new vehicle. If you do this, it will help you learn about the special features and controls. In this supplement, you'll find that words and pictures work together to make things easy to understand.

## Index

A good place to look for what you need is the Index in the back of this supplement. It's an alphabetical list of all that's in the supplement, and the page number where you'll find it.

## Model Reference

This supplement contains information that covers C-Series conventional cab models and B7 Chassis models as shown. Most models are unfinished from the factory.



## **Section 1    Features and Controls**

This section explains how to start and operate your vehicle.

- 1-2     Starting Your LPG Vehicle
- 1-3     Cold Weather Operation
- 1-3     Restarting Your LPG Vehicle While Moving (Automatic Transmission)
- 1-4     Reduced Engine Power Light
- 1-4     Malfunction Indicator Lamp

# Starting Your LPG Vehicle

## Automatic Transmission

Set the parking brake and move your shift lever to NEUTRAL (N) or PARK (P) if so equipped. Your engine won't start in any other position -- that's a safety feature.

## Manual Transmission

Set the parking brake, shift your gear selector to NEUTRAL (N) and hold the clutch pedal to the floor while starting the engine.

## Starting Your Engine

1. Without pressing the accelerator pedal, turn your ignition key to START. When the engine starts, let go of the key. The idle speed will go down as your engine gets warm.

## NOTICE:

**Holding your key in START for longer than 15 seconds at a time will cause your battery to be drained much sooner. And the excessive heat can damage your starter sooner.**

2. If the engine doesn't start in three seconds, hold your key in START and crank the engine for 12 more seconds, unless it starts sooner. When the engine starts, let go of the key.
3. If your engine still won't start, check for the following conditions:
  - The LPG fuel tank is empty.
  - The manual shut-off valve is closed. See "LPG Manual Shut-off Valve" in the Index.
  - The LPG fuel system fuse is bad. See "Fuses" in the Index.

If none of these conditions exist, your vehicle may require service.

## LPG Engine Warm-Up

When you've started your engine, let it run for 20 or 30 seconds to warm-up before you put a load on the engine.

Drive at moderate speeds for the first few miles, especially in cold weather. Running a cold engine at high speed can damage it.

## Cold Weather Operation

In cold weather, stalling and hard starting may occur. If the engine coolant temperature is below freezing (32°F (0°C)), the REDUCED ENGINE POWER light will come on. Refer to "Reduced Engine Power Light" in this Section.

For better cold weather starting and warm-up, you can do the following:

- Move the vehicle to a warm garage area.
- Use an engine coolant heater. Refer to "Engine Coolant Heater" in the Index of your GM owner's manual.

## Restarting Your LPG Vehicle While Moving (Automatic Transmission)

If you have to restart the engine while the vehicle is moving, you'll have to shift the automatic transmission to NEUTRAL (N). This safety feature prevents starting the engine when the transmission is in a drive gear.

## Reduced Engine Power Light



If the engine coolant temperature is below freezing (32°F (0°C)), the REDUCED ENGINE POWER light will come on. In this mode, the engine speed will not go above idle, even if you press the accelerator pedal. The light will stay on and the engine will operate in this mode until the engine coolant temperature reaches 32°F (0°C). You can then drive your vehicle as normal.

If the engine coolant temperature is above freezing (32°F (0°C)) and the engine switches to or continues to operate in the reduced power mode, your vehicle may require service.

## Malfunction Indicator Lamp (Check Engine Light)



Your vehicle is equipped with a computer that monitors the operation of the LPG fuel system. If the computer detects a specific emission system problem, the CHECK ENGINE light will come on. Your vehicle may require service. See “Malfunction Indicator Lamp” in the Index of your GM owner’s manual.

## **Section 2 Problems on the Road**

This section tells you what to do if you have a problem on the road.

2-2 LPG Manual Shut-off Valve

2-2 In Case of a LPG Leak

2-3 Jump Starting

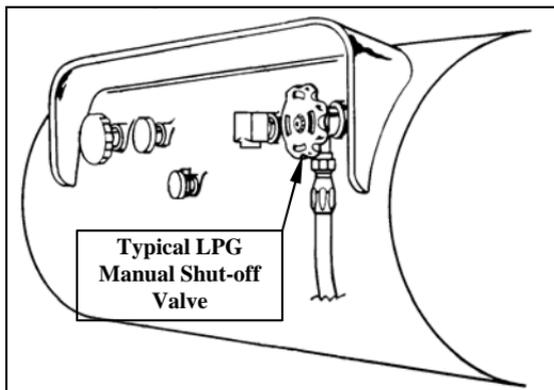
2-3 Towing Your Vehicle

## LPG Manual Shut-off Valve

The LPG manual shut-off valve is located on the fuel tank. To close the valve, turn the handle clockwise. To open the valve, slowly turn the handle counterclockwise. Always operate your vehicle with the manual shut-off valve fully open.

Your vehicle may have a variety of different LPG fuel tanks. The tank and the manual shut-off valve can be mounted in many different locations.

Here's a typical LPG manual shut-off valve.



The manual shut-off valve has an internal excess flow valve. Under certain conditions, this valve will close and stop fuel flow. This can happen if the fuel lines are empty and the manual shut-off valve is opened too quickly. To reset the excess flow valve, close the manual shut-off valve and then slowly open it.

## In Case of a LPG Leak

It's normal to smell a slight LPG odor right after you turn-off your vehicle. However, if you smell a persistent LPG odor or hear a hissing sound, the LPG fuel system on your vehicle might have a leak. Turn the manual shut-off valve on the LPG fuel tank clockwise to close the valve. See "LPG Manual Shut-off Valve" in this Section. Have the vehicle towed to an authorized LPG service facility.

## Jump Starting



### **CAUTION:**

If the LPG fuel system has a leak, a spark from jumper cables could ignite the LPG. You or someone else could be badly burned. Do not jump start your vehicle if you smell LPG or hear a hissing sound.

Before jump starting your vehicle, check for a LPG leak. If you smell a persistent LPG odor or hear a hissing sound, the LPG fuel system on your vehicle might have a leak. Do not try to jump start your vehicle. Turn the manual shut-off valve on the LPG fuel tank clockwise to close the valve. See “LPG Manual Shut-off Valve” in this section. Have the vehicle towed to an authorized LPG service facility.

See “Jump Starting” in the Index of your GM owner’s manual for step by step jump starting instructions.

## Towing Your Vehicle



### **CAUTION:**

Towing your vehicle with improperly positioned tow straps, hooks or chains can damage the LPG fuel system and cause a leak. You or someone else could be injured. Do not use the LPG fuel system components and/or fuel lines as towing attachment points.

To prevent damage to the LPG fuel system, use only the attachment points shown in the GM owner’s manual. See “Towing Your Vehicle” in the Index of your GM owner’s manual for towing instructions.



## **Section 3    Service Care**

Here the manual tells you how to keep your vehicle running properly.

3-2     Doing Your Own Service Work

3-2     Fuel (LPG Vehicle)

3-2     Filling Your LPG Fuel Tank

3-5     Fuel Filling Problems

3-5     Fuses and Circuit Breakers

3-5     Capacities and Specifications

## Doing Your Own Service Work

### CAUTION:

Never try to do your own service work on the LPG fuel system. The LPG fuel system operates under high pressure. You could be injured and your vehicle damaged if you try to do service work. Service and repair of the system should only be performed by a trained LPG service technician with the proper knowledge and tools.

## Fuel (LPG Vehicle)

It is recommended that you use only HD-5 grade LPG. This fuel grade will provide improved driveability and emission control system performance compared to other grades, especially in cold weather.

LPG that does not meet these specifications may cause fuel system or engine damage. Repairs may not be covered under warranty.

## Filling Your LPG Fuel Tank

### CAUTION:

Liquefied Petroleum Gas (LPG) is extremely flammable. If something ignites it, you could be badly burned. Keep sparks, flames and smoking materials away from LPG. Do not smoke if you are near LPG or refueling your vehicle.

### CAUTION:

Liquefied Petroleum Gas (LPG) is stored in the fuel tank at pressures up to 312 psi (2.2 MPa). To prevent personal injury, never:

- Fill to a pressure greater than 312 psi (2.2 MPa).
- Fill a leaking or damaged tank.



## **CAUTION:**

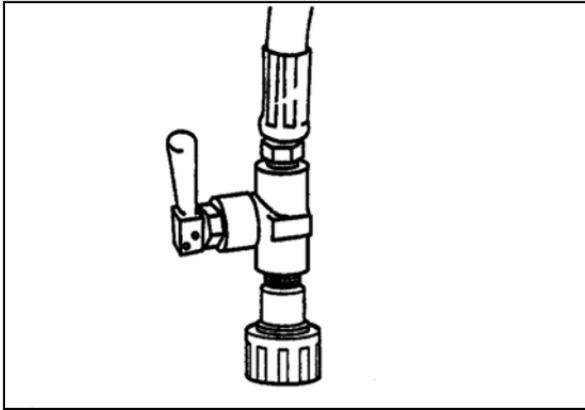
**Liquefied Petroleum Gas (LPG) can cause severe cold burns and frostbite. Never let liquid LPG contact your skin or eyes. When filling your LPG fuel tank, always wear gloves approved for handling LPG and appropriate eye protection.**



## **CAUTION:**

**If your vehicle is parked on an angled surface, the auto-stop fill device may not function correctly. If the tank is overfilled, the pressure relief device (PRD) may open. You could be injured. Make sure your vehicle is parked on a level surface when filling the LPG fuel tank.**

Your vehicle may have a variety of different LPG fuel tanks. Unless you are experienced with filling a LPG fuel tank, consult a qualified LPG station operator.



Here is a fuel filling procedure using a typical LPG fill nozzle:

1. Turn off the engine and set the parking brake.
2. Remove the fill valve cap. Turn it to the left (counterclockwise).
3. Inspect the fill valve seal. Make sure the seal is seated in the groove. Never connect the fill nozzle to the valve if the seal is missing or damaged. The seal must be replaced. See “Fill Valve Seal” in the Index.

4. Connect the LPG fill nozzle to the valve.
5. Flip the fill nozzle lever 90° to lock the nozzle.
6. Open the liquid level gauge (80% fill / “spitter” valve) on the LPG fuel tank.
7. Start the LPG fuel pump to begin refueling.
8. When LPG has stopped transferring or white vapor escapes from the remote outage valve, close the fuel supply valve.
9. Close the liquid level gauge (80% fill / “spitter” valve).
10. Flip the fill nozzle 90° to unlock the nozzle.
11. Disconnect the fill nozzle.
12. Return the fill nozzle to the dispenser.
13. Install the fill valve cap. Turn it to the right (clockwise).

## Fuel Filling Problems

Under certain conditions, you may notice it takes longer to fill your LPG fuel tank on a hot day. This is caused by an increase in the pressure inside the tank. This is normal and does not indicate a problem with the tank.

## Fuses and Circuit Breakers

The LPG fuel system wiring in your vehicle is protected from short circuits by a 3-amp fuse. The fuse is located in a fuse holder near the windshield washer fluid reservoir.

If this fuse is bad, your vehicle will not start. Be sure to replace this fuse with a fuse of the same rating. Do not use a fuse of higher amperage.

## Capacities and Specifications

### Cooling System Capacity

Model	Quarts (Liters)
8.1L (manual trans)	27.0 (25.5)
8.1 L (auto trans)	25.0 (23.7)

Above capacities (volumes) are approximate and do not include heaters or lines added by school bus body builders.

### Normal Maintenance Replacement Parts

Service Replacement Part and Filter Recommendations

LPG Fuel Filter	F4-20804-001
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## **Section 4    Maintenance Schedule**

This section tells you when to perform vehicle maintenance.

4-2      Part A: Scheduled Maintenance Services

4-5      Part B: Owner Checks and Services

4-5      Part C: Maintenance Record

## Part A: Scheduled Maintenance Services

### Maintenance Schedule

The following maintenance items are specific to the LPG fuel system on your vehicle. These items are required *in addition to* the maintenance items listed in your GM owner's manual.

The services shown in this schedule should be performed after 100,000 miles (166 000 km) at the same intervals.

#### 30,000 Miles (50 000 km)

- ❑ Inspect intake system for vacuum leaks.
- ❑ Inspect the outlet elbow pressure relief device (PRD). (62)
- ❑ Inspect the fuel mixer cover pressure relief device (PRD). (62)
- ❑ Replace LPG fuel filter (or every 12 months, whichever occurs first). (3)
- ❑ Check all vacuum lines and fittings.
- ❑ Check all fuel lines and fittings.

- ❑ Perform ignition system inspection. (28)
- ❑ Perform mixer air valve service. (60)

#### 60,000 Miles (100 000 km)

- ❑ Check intake system for vacuum leaks.
- ❑ Inspect the outlet elbow pressure relief device (PRD). (62)
- ❑ Inspect the fuel mixer cover pressure relief device (PRD). (62)
- ❑ Check converter / check regulator primary and secondary pressures. (61)
- ❑ Replace LPG fuel filter (or every 12 months, whichever occurs first). (3)
- ❑ Check all vacuum lines and fittings.
- ❑ Check all fuel lines and fittings.
- ❑ Replace spark plugs and perform ignition system inspection. (28)
- ❑ Perform mixer air valve service. (60)

## **90,000 Miles (150 000 km)**

- ❑ Check intake system for vacuum leaks.
- ❑ Inspect the outlet elbow pressure relief device (PRD). (62)
- ❑ Inspect the fuel mixer cover pressure relief device (PRD). (62)
- ❑ Replace LPG fuel filter (or every 12 months, whichever occurs first). (3)
- ❑ Check all vacuum lines and fittings.
- ❑ Check all fuel lines and fittings.
- ❑ Perform ignition system inspection. (28)
- ❑ Perform mixer air valve service. (60)

## **120,000 Miles (166 000 km)**

- ❑ Check intake system for vacuum leaks.
- ❑ Inspect the outlet elbow pressure relief device (PRD). (62)
- ❑ Inspect the fuel mixer cover pressure relief device (PRD). (62)
- ❑ Check converter / check regulator primary and secondary pressures. (61)
- ❑ Replace LPG fuel filter (or every 12 months, whichever occurs first). (3)
- ❑ Check all vacuum lines and fittings.
- ❑ Check all fuel lines and fittings.

- ❑ Replace spark plugs and perform ignition system inspection. (28)
- ❑ Perform mixer air valve service. (60)

## **FOOTNOTES**

- (3) = An Emission Control Service.
- (28) = Remove and inspect the spark plugs. Inspect the spark plug wires for damage. Check the spark plug wire connections at the plug and at the coil. Inspect wire harness connections at each coil. Repair or replace parts as necessary.
- (60) = Remove the mixer cover and spring from the mixer. Remove the air valve assembly from the mixer body. Inspect for dirt, oil contamination or damage. Clean or repair as necessary.
- (61) = If primary and secondary pressures are within specification, no further action is necessary. If pressures are out of specification, remove converter cover, spring and diaphragm. Inspect for dirt, oil contamination or damage. Clean or repair as necessary.

- (62) = A binding or sticking PRD will create a vacuum leak and cause a lean condition. Inspect for the following:
  1. Inspect the PRD housing for cracks or damage.
  2. Inspect the outside diameter of the PRD piston for dirt, oil, contamination, etc. Clean using oxygen sensor safe carburetor cleaner. If necessary, replace the PRD.
  3. Inspect the PRD seal and the PRD sealing surface for leaks. Use a propane enrichment tool or spray water around the suspected leak point. Observe idle quality or HO2S activity to determine if a leak exists. Clean using oxygen sensor safe carburetor cleaner. If necessary, replace the PRD.

## **Part B: Owner Checks and Services**

### **At Each Fuel Fill**

#### **Fill Valve Seal**

Inspect the fill valve seal. Make sure the seal is seated in the groove. Replace if missing or damaged.

### **At Least Twice a Year**

#### **Low Pressure Regulator (LPR) Coolant Hoses**

Inspect the LPR coolant hoses twice a year (for example, spring and fall). Have the hoses replaced if they are cracked, swollen or deteriorated. Inspect all fittings and clamps; replace if necessary.

### **At Least Once a Year**

#### **LPG Fuel System Leak Inspection**

Inspect the LPG fuel system for leaks once a year using a liquid or an electronic leak detector. If a leak is found, repair or replace the component as required.

## **Part C: Maintenance Record**

After the scheduled services are performed, enter the date, odometer reading and services performed on the maintenance record charts provided here. Any additional information from “Owner’s Checks and Services” can be added on the following record pages.

## Maintenance Record

DATE	ODOMETER READING	SERVICED BY	MAINTENANCE PERFORMED

## Maintenance Record

DATE	ODOMETER READING	SERVICED BY	MAINTENANCE PERFORMED



## **Section 5    Customer Assistance Information**

This section tells you how to contact QUANTUM for technical assistance.

5-2      Technical Assistance

5-2      Parts and Service

5-2      Warranty Claims

## **Technical Assistance**

For LPG fuel system technical assistance, contact:

QUANTUM Technologies, Inc.  
17872 Cartwright Road  
Irvine, CA 92614  
1-800-816-8691

## **Parts and Service**

For parts orders, the location of the nearest authorized service center, a service parts book or a labor time guide, contact:

QUANTUM Technologies, Inc.  
17872 Cartwright Road  
Irvine, CA 92614  
1-888-904-6726

## **Warranty Claims**

For dealers or fleets performing warranty repairs, submit an invoice or work order to the following address. Be sure to include your standard hourly labor rate.

QUANTUM Technologies, Inc.  
17872 Cartwright Road  
Irvine, CA 92614

Attn: Medium Duty Warranty Claims Processing

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